Video lecture

https://youtu.be/-8nRJWkisUw

What?

One of the fundamental theory in financial technical analysis is mean reversion. This is to suggest that the prices will revert back to their long established average levels. This concept can be analogous to a rubber band. If we extend a rubber band from its neutral state it is natural to expect a snap back to its original neutral state. We could also look at it as: at its extended state it may be less likely to extend further than to revert back to its original neutral state.

Method

While many web sites offer free technical analysis tools, we will be using Stata.

tftools movingaverage calculates the moving average for a single time-series variable. The window for the moving averaging can be specified as well as the type of averaging (i.e. simple or exponential). You can also calculate moving standard deviation as well as moving maximum, minimum and sum. *tftools movingaverage* creates a new variable. The data must first be `tsset`.

Syntax and options

tftools movingaverage [*if*] [*in*], symbol(*variable*) generate(*newvar*) period(integer) ma_type(string)

- *symbol(variable)* is the variable that the moving average calculation is based upon (usually the stock symbol that contains the daily prices).
- *generate(newvar)* is the new variable prefix for the calculated moving average values.
- *period(integer)* is the size of the moving average window, expressed as an integer number of time periods. *ma_type* is the moving average type: *sma* (simple moving average), *ema* (exponential moving average), *sd* (moving standard deviation), *sum* (moving sum), *min* (moving minimum) and *max* (moving maximum).

Example

```
net install http://researchbtn.com/stata/210/tftools.pkg, force
freduse SP500, clear
drop if SP500==.
drop date
rename daten date
gen obs=_n
tsset obs
tftools movingaverage if year(date)>2015, symbol(SP500) generate(SP500) \\\
                                                period(100) ma_type(sma)
twoway (line SP500 date) (line SP500_sma_100 date) if year(date)>2015
```

Figure 1: Daily S&P-500 index and 100 days simple moving average

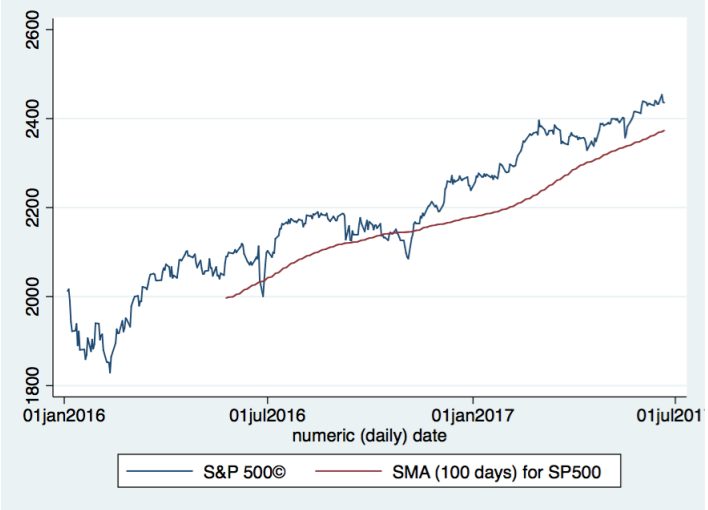

Figure 1 shows the simple moving average for the daily S&P-500 index. Moving averages are the building blocks of the financial technical analysis. It is common to use 20 and 50 days for short-term moving averages as well as 100 and 200 days as the long-term moving averages.

Example

```
freduse SP500, clear
drop if SP500==.
drop date
rename daten date
gen obs=_n
tsset obs
tftools movingaverage if year(date)>2010, symbol(SP500) generate(SP500) \\\
                                          period(50) ma_type(sma)
tftools movingaverage if year(date)>2010, symbol(SP500) generate(SP500) \\\
                                          period(200) ma_type(sma)
twoway (line SP500 date) (line SP500_sma_50 date) (line SP500_sma_200 date) \\\
                                          if year(date)>2010
```

Figure 2: Daily S&P-500 index, 50 days and 200 days simple moving averages

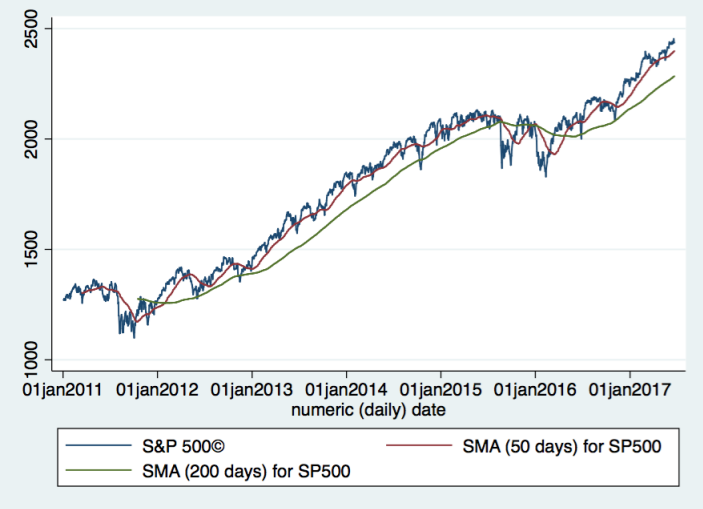

Figure 2 shows a short-term (50 days) and a long-term (200 days) moving averages. These two, in combination, may signal two of the most common technical analysis signals namely the so-called "golden cross" (up trend signal) and "death cross" (down trend signal). Figure 2 shows a golden cross during 2016 for S&P-500 index.

While MACD analysis in Figure **??** shows a down trend, the golden cross in Figure 2 shows an up trend. The conflicting technical analysis signals are common as none of these analysis tools will ever provide a consistently reliable signal.